

performed according to the shutter period computed in step S1, and picture taking is performed. Then, in step S4, a determination is made as to whether the release button 42 is in the full-push position. If release button 42 is not in the full-push position, processing is completed and the process ends in step S9. On the other hand, if it is determined in step S4 that release button 42 is in the full-push position, it is determined that the camera is in a continuous shooting mode and the process moves to step S5 where the subject brightness is again computed by photometric element 27, exposure compensation is again performed, and a new control aperture value and shutter period are computed. The process then moves to step S6 where a comparison is made as to whether the computed control aperture value is equal to the previous control aperture value. If it is determined in step S6 that the computed control aperture value and the previous control aperture value are not equal, the process moves to step S7 where variable aperture 40 is driven and controlled only by the value of the difference between the previous aperture control value and the current control aperture value. The process then moves to step S8 where the shutter opening operation is performed in accordance with the shutter period computed in step S5, picture taking is performed, and the process returns to step S4. On the other hand, if it is determined in step S6 that the current control aperture value and the previous control aperture value are equal, the process skips step S7 and proceeds to step S8.

Patent (1F)

(11) Patent Number:

5,459,511

(47) Date of Patent:

Oct. 17, 1995

IMPROVED
A VARIABLE APERTUREInventors: Senoh
Shigeo, both of Japan
Inventor: Senoh
Shigeo, both of Japan

348/335; 348/363; 348/341;
354/219; 354/410
348/335, 340,
342, 353, 364; 354/219, 224,
410; H54N 3/232

Name Claim

DOCUMENTS

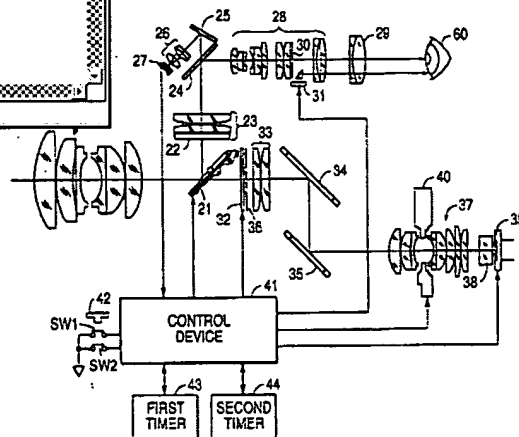
Shi et al. 348/341 X
Shi et al. 348/341 X
Shi et al. 348/341 X
Shi et al. 348/341 X

R. Greening

(57) ABSTRACT

A camera having improved positioning of a variable aperture. A picture taking lens has an image of a subject on an image forming plane. A picture taking optical system has a picture taking optical path which extends from the image forming plane to an image recording medium. The picture taking optical system receives the image focused on the image forming plane and projects the image to the image recording medium. A variable aperture is positioned in the picture taking optical path between the image forming plane and the image recording medium, and regulates light passing through the picture taking optical system without regulating light passing through a viewfinder optical system. Before an individual photograph is taken, the variable aperture is set to an aperture size which is approximately midway between the maximum aperture size and the minimum aperture size. However, when the camera is in a continuous shooting mode, a variable aperture control device sets the variable aperture to a first aperture size before a first photograph is taken and then, after the first photograph is taken, drives the variable aperture directly to a new aperture size corresponding to the next photograph. The camera also controls the camera shutter to be released after a specific, constant time from the pressing of the release button.

22 Claims, 15 Drawing Sheets



	U	1	Document ID	Issue Date	
1			US 5459511 A	19951017	Camera
2			US 4096732 A	19780627	Camera
3			US 3855601 A	19741217	PHOTOM

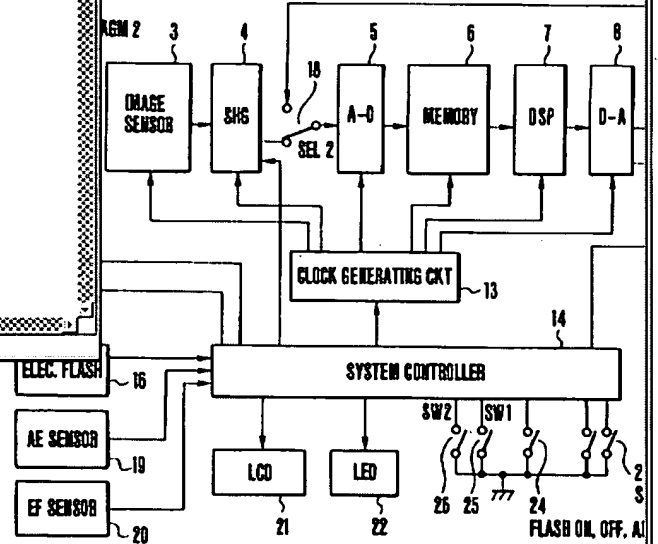
(6) First of all, a normal recording sequence will be described below.

(7) When a release button (not shown) is pressed to turn on the switch SW125, the disk drive motor 27 is started up to initiate recording on the video floppy disk 12. The system controller 14 reads measured-light data from the AE sensor 19 and performs a light-measurement computation. When the release button is further pressed to turn on the switch SW226, the diaphragm 2 is driven up to an aperture value determined by the light-measurement computation. Then, exposure of the image sensor 3 is executed at a predetermined electronic shutter speed.

(8) The image data stored in the image sensor 3 is read in accordance with a clock signal generated by the clock generating circuit 13. The SHG 4 samples and holds the read image data and executes gamma correction of the sampled and held image data. The analog image data outputted from the SHG 4 is converted into digital image data by A-D conversion executed by the A-D converter 5. The digital image data is passed through the memory 6 and is subjected to signal processing in the DSP 7. The processed digital image signal is subjected to D-A conversion in the D-A converter 8, and the analog output of the D-A converter 8 is recorded on the video floppy disk 12 through the switch 17 and the recording-reproducing head 11.

(9) The recording sequence executed during the single shooting mode is as described above. High-speed continuous shooting is realized by repeating the

FIG. 1



Details Text Image HTML FULL

EAST Advanced Find

Find what: 19

Area: ☐ All ☒ Sel/Ovr

Direction: ☐ Up ☒ Down

Match word: ☐ Whole ☐ Part

Look in: ☐ Grid ☒ Documents

☐ Match case

Find Next Cancel

5		US 6518999 B1	20030211	Electronic shooting
6		US 4910600 A	19900320	Image pic

KWIC

Brief Summary Text - BSTX (13):

To achieve such an object, in an embodiment of the invention, the image pickup apparatus for picking up an image in response to the exposure constant is characterized in that there are provided first recording means for performing frame recording of a picked-up image, second recording means for performing field recording of a picked-up image, selecting means for selecting one of the first recording means and the second recording means prior to picking up the image, and exposure constant setting means for setting a predetermined exposure constant for the selected recording means.

Brief Summary Text - BSTX (14):

Thereby, because that one of the first recording means for performing frame recording and the second recording means for performing field recording is selected prior to picking up the image and the exposure constant suited to the selected recording means is set by the setting means, recording can be carried out in either of the frame recording mode or the field recording mode, and an image of good quality can be obtained by making the most of the advantage of each of the above-described recording methods.

Patent [19]

[11] Patent Number: 4,910,600

[45] Date of Patent: Mar. 20, 1990

APPARATUS

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 and Katsuhiko Kanda, Tokyo, Japan

[51]

G. 35, 1988

Publication Priority Data

Japan 63-279941

HIDON 8/238

155/2228 155/909

155/21134 211.15,

155/909, 223, 213.22, 342

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D. F. Ng

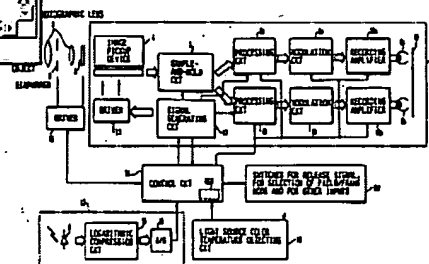
Attorney: Kanda—Stephen Brich
 Attorney: Agent or Firm—Kanda, Blacker, Dakey & Driscoll

[57] ABSTRACT

An image pickup apparatus for picking up an image in accordance with an exposure constant operating with selection of a first recording mode for performing frame recording of the picked-up image and a second recording mode for performing field recording of the picked-up image and comprising a selecting circuit for selecting one of the first recording mode and the second recording mode prior to picking up the image and an exposure constant setting circuit for setting a predetermined exposure constant to the selected recording mode, whereby the exposure constant is a shutter time and an aperture determined depending on the brightness of an object to be photographed, whereby in the first mode, the exposure constant is set so that the aperture is fixed and the shutter time is made changeable in accordance with the brightness, while in the second mode, the exposure constant is set so that the shutter time is fixed, and the aperture is made changeable in accordance with the brightness.

16 Claims, 9 Drawing Sheets

	U	1	Document ID	Issue Date	
5			US 6518999 B1	20030211	Electronic shooting
6			US 4910600 A	19900320	Image pic
7			US 6628328 B1	20030930	Image pic two mode



Detailed Description Text - DETX (30):

Moreover, exposure control may be done using both the measurement result of the photometry circuit 46 and the computation result of image data output from the image sensing element 14 by the image processing circuit 20.

Detailed Description Text - DETX (33):

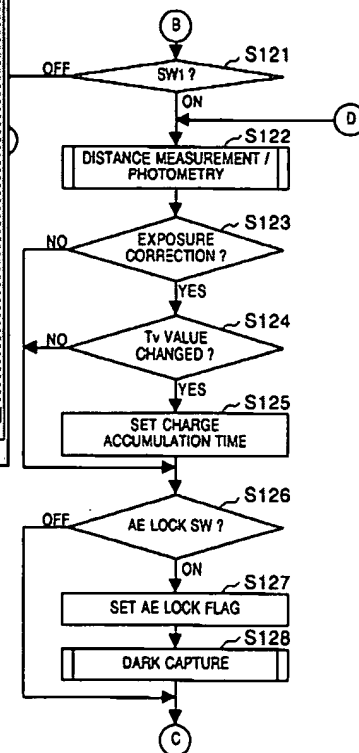
Of the indication contents of the indication unit 54, those displayed on the LCD or the like include, e.g., a single/continuous shot indication, self timer indication, compression ratio indication, recording pixel count indicating, recorded image count indication, remaining recordable image count indication, shutter speed indication, aperture value indication, exposure correction indication, flash indication, red-eye suppression indication, macro image sensing indication, buzzer setup indication, remaining timepiece battery capacity indication, remaining battery capacity indication, error indication, information indication using numerals of a plurality of digits, attachment/detachment indication of recording media 200 and 210, attachment/detachment indication of a lens unit 300, communication I/F operation indication, date/time indication, connection indication with an external computer, and the like.

Mar. 23, 2004

Sheet 3 of 14

US 6,710,808 B1

FIG. 3



	U	1	Document ID	Issue Date	
1			US 6518999 B1	20030211	Electronic shooting
2			US 6710808 B1	20040323	Image se
3			US 6710807 B1	20040323	Image se

US-CL-CURRENT: 396/245, 396/FOR.744

ABSTRACT:

PURPOSE: To prevent time intervals of respective frames from varying by carrying on continuous photographing operation at a set continuous photographic speed even if exposure condition deviates from the best condition when the photographic-speed priority operation mode of continuous photography is set.

CONSTITUTION: The continuous shot or single-shot mode is set with a mode changeover switch 17, and in continuous short mode, a continuous short frame quantity priority mode can be set. When the continuous shot frame quantity priority mode is set, a continuous short frame quantity set with a continuous short frame setting switch 18 is read in a system controller 8 and displayed on a display part 19. When a shutter speed and an aperture value which are determined according to the light measurement output of a light measuring circuit 7 result in not proper exposure, but underexposure or overexposure, that is displayed on a display part 19 and a routine of continuous-shot photography is entered. Consequently, the track, etc., of a moving subject can be photographed accurately and intermittently.

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Details | Text | Image | HTML | FULL

	U	1	Document ID	Issue Date	
5			US 5012271 A	19910430	Exposure
6			JP 01277829 A	19891108	EXPOSU
7			US 4362371 A	19821207	Motor dri

特開平1-277829 (5)

電子システムに用いる、
にも適用できるものである。
に本装置によれば、移動する被
写体に対して撮影することがで
きる連続撮影をあらゆる条件の撮影
したいという要望に十分に応え

発明者 奥田 光孝 株式会社
代理人 藤田 七郎

説明
この発明は、連続撮影方式を用いた電
気的制御を有するカメラ装置のプロ

第1図に示したカメラの構成概
略するためのフローチャート。
の動作タイミングの一例を説明
する。
の動作タイミングの別の例を説
明する。
カメラと被写体との関係を示

第1図

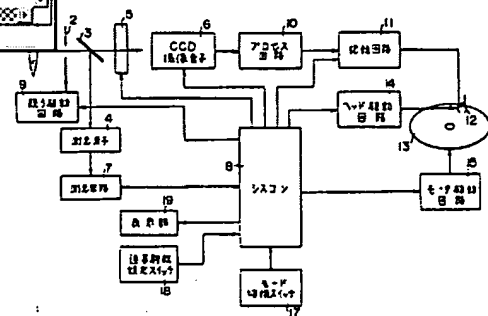


FIG. 8 is a view for graphically illustrating a relation between the iris values of the mechanical shutter 102 and the amount of exposure which the image sensor device 103 receives. In the exposure control of the image pickup apparatus implemented in the form of a video camera according to the instant embodiment of the invention, the image pickup apparatus operates in a similar manner as the conventional video camera until the shutter button 110 is pushed. More specifically, electric charges accumulated in the image sensor device 103 during a period corresponding to one field are read out on a field-by-field basis, wherein the amount of exposure is arithmetically determined on the basis of the luminance signal derived by the signal processing circuit 106 to thereby control the iris of the mechanical shutter 102 by means of the mechanical shutter control circuit 108 so that a predetermined amount of exposure can be attained. Unless the electronic shutter is used, the exposure of the image sensor device 103 is started from the time points t.sub.1, t.sub.2, t.sub.3 and t.sub.4, respectively, at which the charges are transferred from the photodiodes 121 to the vertical CCDs 122. Accordingly, when the shutter button 110 is pushed during a period from the time point t.sub.3 to the time point t.sub.4, exposure for generating a still picture will be started from the time point t.sub.4. In this case, it is assumed that an area indicated by A (amount of exposure) in FIG. 8 represents a proper amount of exposure for an object whose picture is currently being taken. On the assumption, in order to ensure a correct or proper amount of exposure in the still picture imaging mode, it is required to operate the mechanical shutter 102 such that an area B shown in FIG. 8 and indicating the amount of exposure during a period from the time point t.sub.4 to a time point t.sub.5 becomes greater than the area A.

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5,847,756 12/1998 Iura et al. 348/220

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59-194575 11/1984 Japan
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63-114487 5/1988 Japan
2-288679 11/1990 Japan

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Primary Examiner—Wendy Garber
Assistant Examiner—Aung S. Moe
Attorney, Agent, or Firm—Antonelli, Terry, Stout & Kraus, LLP

[57] ABSTRACT

An image pickup apparatus capable of generating a motion picture and a still picture. An amount of exposure in a still imaging mode is increased as compared with the amount of exposure for mode is increased as compared with the amount of exposure for one field in the motion picture imaging mode, preferably twice as large as the latter. In the still picture mode, electric charges are swept out from a CCD by an exposure control simultaneously with closing of a diaphragm for adjusting the amount of exposure. Upon occurrence of error in the closing operation of the diaphragm, the amount of exposure in the still picture mode is set to a design value. On the basis of difference between the design value and an actually measured value of the amount of exposure, gain for video signal is corrected. In the motion picture mode, the diaphragm and the electronic shutter speed is adjusted for preventing flicker from making appearance under illumination of a fluorescent lamp in indoor photographing. The adjusted speed can be 1/100 sec.

Apr. 7, 1995,

6-070431

6-160930

6-193194

04N 5/225

21; 348/363

8/220, 221,

32; 396/235

30 Claims, 25 Drawing Sheets

Details Text Image HTML KWC

